

Sub DS
Cont'd

24. (AMENDED) The method of claim 13, wherein the filler is selected from the group consisting of silica, Aluminum Oxide, 92% Alumina, 96% Alumina, Aluminum Nitride, Silicon Nitride, Silicon Carbide, Beryllium Oxide, Boron Nitride and Diamond powder.

25. (AMENDED) The method of claim 13, wherein the composition further comprises a toughening agent selected from the group consisting of elastomers, rubber, epoxy terminated elastomer, hydroxy-terminated polysulfone oligomers, and combinations thereof.

26. (AMENDED) The method of claim 25, wherein a viscosity of the toughening agent includes from about 500 to about 1,000 centipoise.

REMARKS

Claims 13 - 26 are pending. Claims 13-26 stand rejected.

The Examiner objected to the information disclosure statement filed 01-26-2001, allegedly because it fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent. Applicants submitted a supplemental response dated October 17, 2001 to the Office Action dated August 6, 2001 that included copies of the following Japanese patents:

Document Number	Date	Country
06057103	3/94	Japan
4-91118	3/92	Japan
2-68	01/90	Japan

3-188186 08/91 Japan

09064237 03/97 Japan

Applicants respectfully submit that they have complied with 37 CFR 1.98(a)(2) which requires a legible copy of each U.S. and Foreign Patent.

Claims 13-26 were rejected under the doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,129,955, in view of Christie *et al.* See enclosed terminal disclaimer of claims 13-26.

The Examiner objected to Claims 13, 20, and 23 under 35 U.S.C. 132, as allegedly containing new matter. The Examiner objected to formulas 1 and 2 under 35 U.S.C. 132, as allegedly containing new matter.

35 U.S.C. 132

The Examiner objected to the recitation in Claim 13 that replaces “dispersed silica” with “dispersed filler, wherein the filler has been treated with a surface treating agent,” because it allegedly introduces new matter. See the Office Action dated December 1, 2001, hereinafter the “Office Action.” Applicants respectfully submit that the Examiner’s objection fails because the method of Claim 13 for “encapsulating a solder joint between an integrated circuit chip and a substrate, comprising the steps of: forming a composition that includes a cyanate ester, a photoinitiator, and a coefficient of thermal expansion reducing dispersed filler,” is supported in Applicants’ specification. Applicants specification discloses that “[t]he compositions of the

present invention contain ..., balance a suitable filler capable of reducing the coefficient of thermal expansion.” See Applicants’ specification, page 25, lines 11-14. Therefore, instead of replacing “dispersed silica” with “dispersed filler, wherein the filler has been treated with a surface treating agent,” as the Examiner alleges, Applicants have replaced “dispersed silica” with “a coefficient of thermal expansion reducing dispersed filler” which is supported by Applicants’ specification.

In light of the foregoing, Applicants respectfully submit the specification supports Claim 13, stating “a coefficient of thermal expansion reducing dispersed filler” is not new matter under 35 U.S.C. 132 because it is supported in Applicants’ specification.

The Examiner objected to the recitation in Claim 23 “based on 100 parts of the cyanate ester.” The Office Action states “[w]ith regard to Claim 23, the specification sets forth “based on 100 parts of resin. The term ‘resin’ is not limited to the cyanate ester disclosed.” See the Office Action, page 3, lines 7-8. Applicants respectfully submit that the Examiner’s objection fails because “cyanate ester” as a “resin” is supported in Applicants’ specification. For example, Applicants’ specification states “[a] preferred encapsulant material for use in the invention is a polymer resin, and particularly an epoxy or a cyanate, or combinations thereof. See Applicants’ specification, page 9, lines 28-29. Applicants disclosure further states “[t]he uncured encapsulant is composed of an epoxy resin, a cyanate, or combinations thereof. See Applicants’ specification, page 11, lines 32-33. Applicants’ disclosure further states “[o]ther suitable cyanate ester resins include the commercial products available under the designations REX-378, REX-379, Arocy B-10, B-40S, B-50, Arocy M-10, M-20, M-30, M-50, Arocy F-40S and F-10 from Ciba Gigy. See Applicants’ disclosure, page 21, lines 23-25. Applicants’ disclosure further

states “[c]yanate ester resins are made from polyfunctional cyanate monomers as described in U.S. Patent No. 4, 094,852. See Applicants’ disclosure, page 23, lines 2-3.

In light of the foregoing, Applicants respectfully submit the recitation in Claim 23, “based on 100 parts of the cyanate ester,” is not new matter under 35 U.S.C. 132 because “cyanate ester” is included in “resins” in Applicants’ specification.

The Examiner objected to the recitation in Claim 20 that “the particle size of the dispersed filler is less than or equal to 31 microns.” The Office Action states “[w]ith regard to Claim 20, the specification teaches that the particulate silica has a particle size of 31 microns or less on page 25, lines 4-6. Applicants have accordingly amended Claim 20 such that Claim 20 states “The method of claim 19, wherein a particle size of the dispersed silica is 31 microns or less.”

In light of the foregoing, Applicants respectfully submit the recitation in Claim 20, “[t]he method of claim 19, wherein a particle size of the dispersed silica is 31 microns or less,” is not new matter under 35 U.S.C. 132 because Applicants’ specification supports *inter alia* “a particle size of the dispersed silica is 31 microns or less.”

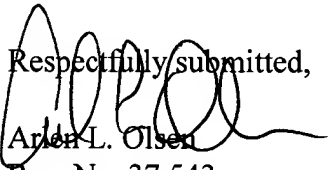
The Examiner objected to formulas (1) and (2) set forth in Claim 15. Applicants have accordingly amended formulas (1) and (2). Applicants’ specification supports Claim 15 as depicted in formulas (1) and (2), wherein each a and b independently include integers from 0 to 3, and at least one a is not 0; wherein c includes integers from 0 to 1; wherein n includes integers from 0 to 8; wherein each each R is independently selected from the group consisting of non-interfering alkyl, aryl, alkaryl, heteroatomic, heterocyclic, carbonyloxy, carboxy, hydrogen, C₁₋₆ alkyl, C₁₋₆ allyl, C₁₋₆ alkoxy, halogen, maleimide, propargyl ether, glycidyl ether and

combinations thereof; A is selected from the group consisting of C₁₋₁₂ polymethylene, CH₂, dicyclopentadienyl, aralkyl, aryl, cycloaliphatic, CH(CH₃), SO₂, O, C(CF₃)₂, CH₂OCH₂, CH₂SCH₂, CH₂NHCH₂, S, C(=O), OC(=O), OCOO, S(=O), OP(=O), OP(=O)(=O)O, alkylene radicals, C(CH₃)₂, and combinations thereof. See Applicants' disclosure, page 19, lines 13-32, and page 20, lines 7-27.

In light of the foregoing, Applicants respectfully submit formulas (1) and (2) and associated text in Claim 15 do not contain new matter under 35 U.S.C. 132 because formulas (1) and (2) and associated text in Claim 15 are supported in Applicants' disclosure.

If the Examiner believes that anything further is necessary in order to place the application in better condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,


Arlon L. Olsen

Reg. No. 37,543

Date: 3-28-2002
Schmeiser, Olsen & Watts
3 Lear Jet Lane, Suite 201
Latham, N.Y. 12110
(518) 220-1850

APPENDIX (Amended Material)

In The Claims

13. (TWICE AMENDED) A method for encapsulating a solder joint between an integrated circuit chip and a substrate, comprising the steps of:

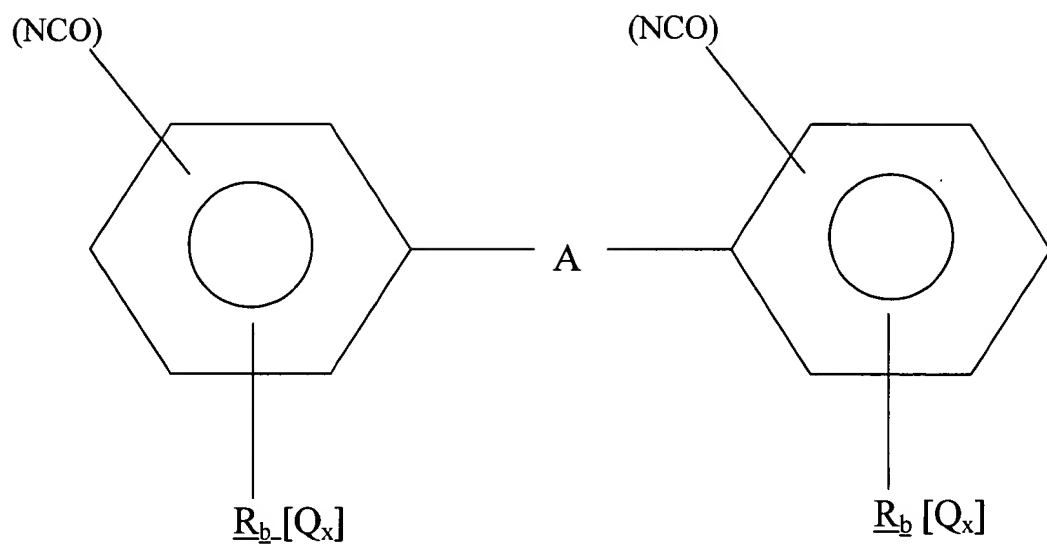
forming a composition that includes a cyanate ester, a photoinitiator, and a coefficient of thermal expansion reducing dispersed filler[, wherein the filler has been treated with a surface treating agent];

applying an amount of the composition at a thickness sufficient to cover substantially all of the solder joint; and

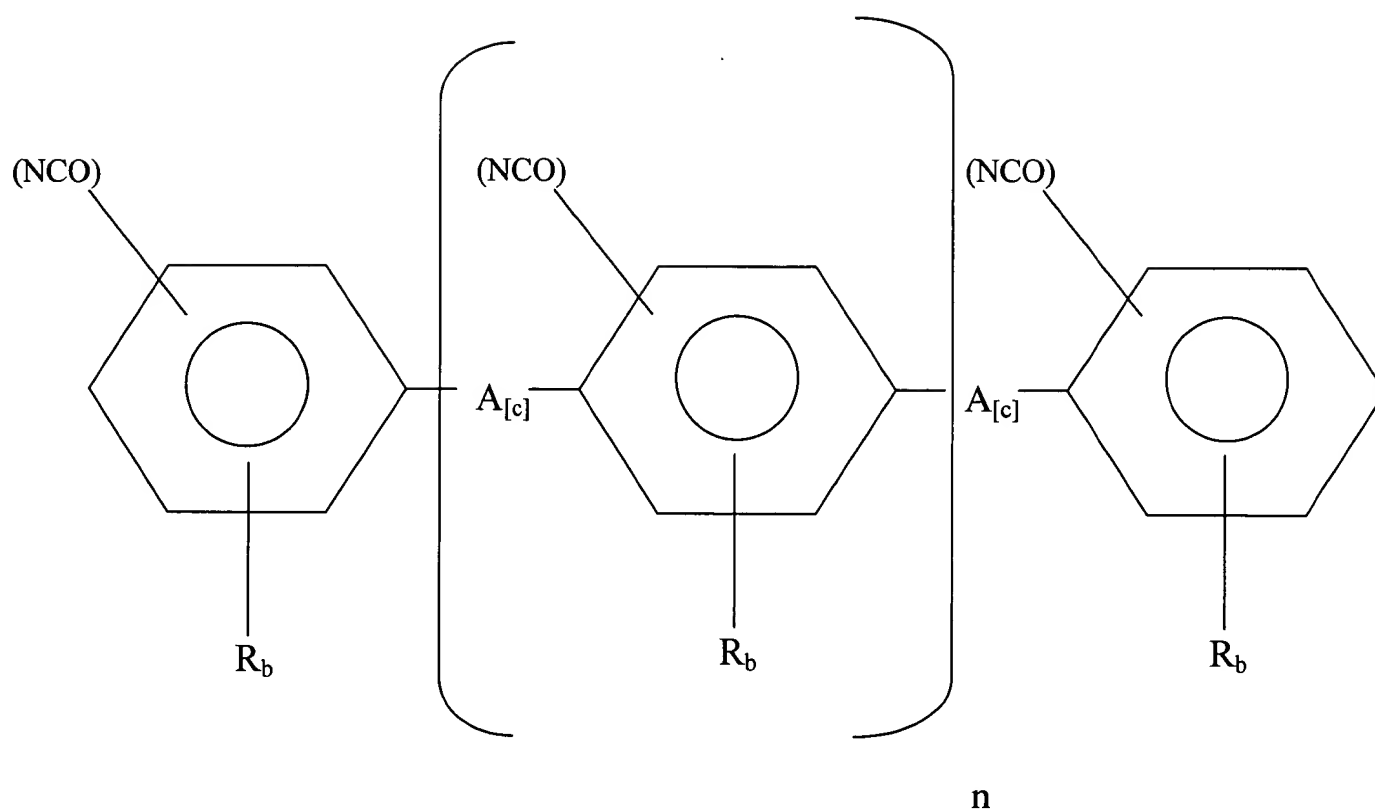
photocuring the composition to reinforce the solder joint.

15. (TWICE AMENDED) The method of claim 13, wherein the cyanate ester is selected from the group consisting of compounds depicted by formulas 1 and 2:

(1)



(2)



wherein each a and b independently include integers from 0 to 3, and at least one a is not 0;

wherein c includes integers from 0 to 1; wherein n includes integers from 0 to 8; wherein each R is independently selected from the group consisting of non-interfering alkyl, aryl, alkaryl,

[C₁₋₆ alkyl, aryl, C₁₋₆ alkyaryl,] heteroatomic, heterocyclic, carbonyloxy, carboxy, hydrogen, C₁₋₆ alkyl, C₁₋₆ allyl, C₁₋₆ alkoxy, [C₁₋₆ alkoxy, C₁₋₆ alkenyloxy, propargyloxy, allyloxy,] halogen, maleimide, propargyl ether, glycidyl ether [maleimidyl, glycidyloxy] and combinations thereof;

A is selected from the group consisting of C₁₋₁₂ polymethylene, CH₂, dicyclopentadienyl, aralkyl, aryl, cycloaliphatic, CH(CH₃), SO₂, O, C(CF₃)₂, CH₂OCH₂, [(CH₂S)_{x=(integers from 0 to [9])}

(CH₂NH)_{x=(integers from 0 to 9)}] CH₂SCH₂, CH₂NHCH₂, S, C(=O), OC(=O), OCOO, S(=O), OP(=O),

OP(=O)(=O)O, alkylene radicals, C(CH₃)₂, and combinations thereof.

20. (TWICE AMENDED) The method of claim 19, wherein a particle size of the dispersed [filler] silica is [less than or equal to]31 microns or less.